THE BOARD OF SUPERVISORS OF THE COUNTY OF STANISLAUS
ACTION AGENDA SUMMARY

DEPT: PUBLIC WORKS — BOARD AGENDA # C-4

Urgent ____ Routine ✓ — AGENDA DATE MAY 8, 2001

CEO Concurs with Recommendation YES ____ NO ____ (Information Attached) — 4/5 Vote Required YES ✓ NO ____

SUBJECT: APPROVAL TO INTRODUCE AND WAIVE THE FIRST READING OF AN ORDINANCE TO AMEND THE 1998 STANISLAUS COUNTY STANDARDS AND SPECIFICATIONS TO PROVIDE FOR MULTIPLE USE STORM DRAINAGE FACILITIES

STAFF RECOMMENDATIONS:

1. FIND THAT THE SUBJECT ORDINANCE DOES NOT HAVE THE POTENTIAL FOR CAUSING A SIGNIFICANT EFFECT ON THE ENVIRONMENT AND, PURSUANT TO SECTION 15061(B)(3) OF TITLE 14 OF THE CALIFORNIA CODE OF REGULATIONS, IS EXEMPT FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT;

(CONTINUED ON PAGE 2)

FISCAL IMPACT: Staff anticipates no direct fiscal impact with the proposed change in development standards and specifications. An increase in potential liability resulting from public access to storm drainage facilities may occur.

BOARD ACTION AS FOLLOWS:

No. 2001-354

On motion of Supervisor Simon, **Seconded by Supervisor** Caruso
and approved by the following vote,
Ayes: Supervisors: Mayfield, Simon, Caruso, and Chair Paul
Noes: Supervisors: None
Excused or Absent: Supervisors: Blom
Abstaining: Supervisor: None

1) X **Approved as recommended**
2) ____ **Denied**
3) ____ **Approved as amended**

Motion: INTRODUCED AND WAIVED THE FIRST READING OF ORDINANCE C.S. 761

Christine Ferraro

ATTEST: CHRISTINE FERRARO TALLMAN, Clerk **By: Deputy** **File No.** ORD-54-H-12

1010-08

STAFF RECOMMEN-DATIONS (continued):

2. PURSUANT TO GOVERNMENT CODE SECTION 65913.2, FIND THAT THE PROPOSED AMENDMENT TO THE 1988 STANISLAUS COUNTY STANDARDS AND SPECIFICATIONS WILL NOT:

   (A) IMPOSE DESIGN CRITERIA THAT WOULD RENDER INFEASIBLE THE DEVELOPMENT OF HOUSING FOR ANY ECONOMIC SEGMENT OF THE COMMUNITY.

   (B) AFFECT ADVERSELY THE HOUSING NEEDS OF STANISLAUS COUNTY.

   (C) IMPOSE DIFFERENT STANDARDS FOR PUBLICLY AND PRIVATELY FINANCED PUBLIC IMPROVEMENTS; AND,

3. INTRODUCE, WAIVE THE FIRST READING, AND APPROVE AN ORDINANCE TO AMEND CHAPTER 4 OF THE 1998 STANISLAUS COUNTY STANDARDS AND SPECIFICATIONS TO PROVIDE FOR MULTIPLE USE STORM DRAINAGE FACILITIES.

DISCUSSION: Recently, your Board expressed a desire that storm drainage ponds be designed as multi-use facilities. Under this concept, the storm water drainage basins would be designed such that they provide the necessary function of controlling storm waters while at the same time allowing further use as a recreational/open space area. This is a concept that is used very successfully in numerous jurisdictions. It will greatly increase the amount of recreational opportunities for the citizens of Stanislaus County.

In order to implement this policy, several changes to existing codes and standards must be adopted. Our present standards require that drainage basins be surrounded by concrete block walls, paved access roads, steep slopes and be free of vegetation. The proposed changes to County Code would eliminate this requirement and allow drainage basins to be constructed that provides for multi-purpose uses.

The design criteria for multiple use drainage facilities establishes a minimum standard (based on performance) for construction of public improvements associated with land development projects in the County. Other jurisdictions have adopted and are using similar multiple use standards and based on their experiences multi-use drainage basins would not make it infeasible to develop housing for any economic segment of the County. Formal adoption of multiple use standards will not adversely affect the housing needs of the County. The standards imposed by this ordinance apply equally to all public improvements,

whether privately or publicly financed. Although staff does not anticipate that the multiple use policy and standards will adversely affect housing development in the County, staff intends to continue improvement of the multiple use design standards in consultation with affected user groups.

The provision of recreational improvements within multi-use facilities would depend to a large degree on the size of the new facility. For the smaller "normal" drainage basin improvements would consist of primarily turf which would allow for passive uses such as walking, picnicking, and turf play. For larger multi-use facilities, an evaluation would be made by the Parks and Recreation Department as to what remaining recreational improvements would be appropriate.

If adopted, several County departments would be responsible for implementing the multiple use policy. The Department of Planning and Community Development would lead with the Planning Commission in determining what "design" is appropriate for each development with input from affected departments and agencies. The Parks and Recreation Department would be responsible for maintaining the turf and landscaping while the Public Works Department would be responsible for operation and maintenance of the storm drainage facilities.

POLICY ISSUE: This action supports the Board's goals of providing a safe and healthy community, community service delivery, and community leadership. Further, this action supports a policy of adopting ordinances that are consistent with State law.

STAFFING IMPACT: No staffing impacts are associated with this action.

JD:

H:\1998Standards&SpecStormDrain.BOS.wpd

ORDINANCE NO. C.S. 761

AN ORDINANCE AMENDING THE 1998 STANISLAUS COUNTY STANDARDS AND SPECIFICATIONS TO PROVIDE FOR MULTIPLE USE STORM DRAINAGE FACILITIES

THE BOARD OF SUPERVISORS OF THE COUNT OF STANISLAUS, STATE OF CALIFORNIA, ORDAINS AS FOLLOWS:

Section 1. Pursuant to section 66411 of the Government Code and Sections 20.56.060 and 20.56.110 of the Stanislaus County Code, the Board hereby amends Chapter 4 of the Stanislaus County Standards and Specifications dated July 1, 1998, to read as set forth in the attached Chapter 4 dated April 24, 2001.

Section 2. This ordinance shall take effect thirty (30) days from and after the date of its passage and before the expiration of fifteen (15) days after its passage it shall be published once, with the names of the members voting for and against the same, in the Modesto Bee, a newspaper published in the County of Stanislaus, State of California.

Upon motion of Supervisor _____, seconded by Supervisor _____, the foregoing resolution was passed and adopted at a regular meeting of the Board of Supervisors of the County of Stanislaus, State of California, this _____ day of _____, 2001, by the following called vote:

AYES: Supervisors:

NOES: Supervisors:

ABSENT: Supervisors:

_____
Pat Paul, Chair of the Board of Supervisors of the County of Stanislaus, State of California

ATTEST:
CHRISTINE FERRARO TALLMAN
CLERK OF THE BOARD OF SUPERVISORS OF THE COUNTY OF STANISLAUS, STATE OF CALIFORNIA

By _____
Deputy Clerk

APPROVED AS TO FORM:
MICHAEL H. KRAUSNICK
COUNTY COUNSEL

By _____
John P. Doering
Deputy County Counsel

C:\Documents\ORDINANC\PW\Dual Use Ord.wpd

CHAPTER 4: STORM DRAINAGE

As Adopted xxxxxxx, 2001

4.1 GENERAL: These Standards have been prepared for use in the design of storm water facilities within the unincorporated areas of Stanislaus County. The criteria and guidelines set forth herein shall be followed in instances where the facilities are subject to review by the Department.

Residential, commercial and industrial developments shall have surface drainage disposal accommodated in one or more of the following ways:

a. Positive Drainage: Positive drainage is a gravity flow storm drainage collection and discharge system into a river, stream, creek, irrigation facility, or other water way.

b. Drainage Retention Facility: Drainage retention facilities may be used when positive drainage is not available.

c. Rock Well: A rock well (vertical or horizontal) may be used only when above methods 4.1a or 4.1b are not feasible. Department approval of the use of a rock well shall be obtained prior to submittal of the drainage plan.

d. On-Site Drainage: Commercial and Industrial properties shall contain all storm drainage on-site unless above methods are available and approved for use by the Department prior to submittal of the drainage plan.

4.2 STANDARD OF DESIGN: All storm drainage facilities within Stanislaus County shall be designed using a 50 year storm or greater. All drainage facilities shall be designed to provide for public safety.

4.3 PEAK FLOW RATE: The peak flow rate shall be used to size pipes and culverts and shall be determined using the following rational formula:

$$Q=CIA$$

a. Peak Flow Rate (Q): Peak rate of flow in cubic feet per second.

b. Coefficient of Runoff (C): Values between 0.0 and 1.0 which are to be extrapolated from the following table:

LAND USE	C
Pavement	0.95
Roofs	0.95
Compacted earth without pavement	0.80
Lawns, pasture and farmland	0.30
Single family residence:	
Over 1.5 acres	0.35
0.5 to 1.5 acres	0.45
6000 sf. to 0.5 acres	0.50
Less than 6000 sf.	0.55
Multi-family residence	
Apts., condos, duplexes, & town homes	0.70
Commercial and industrial	0.90

c. Intensity (I): The average intensity of rainfall in inches per hour for a duration equal to the time of concentration (Tc) and is determined using the following formula:

$$I = Im \times \frac{M.A.P.}{10.9}$$

Im: Average intensity of rainfall in inches per hour for the Modesto rainfall gauging station. Coefficient is extrapolated from Plate 4-A using the calculated time of concentration (Tc).

Tc: The time of concentration or the sum of the overland flow and conduit flow times. The following table shows minimum travel times to be used when the calculated Tc is less than the minimum shown.

Land Use	Minimum Travel Time
Single family (0.5 to 1.0 acre)	30 min.
Single family (less than 0.5 acre)	20 min
Multi-family	20 min
Commercial & Industrial	10 min
Gutters	1 ft. / Sec

M.A.P.: The mean annual precipitation for the design area in question. Coefficient is extrapolated from Plate 4-B.

d. Area (A): The total tributary area, expressed in acres, that will contribute runoff to the drainage system, regardless of the limits of the development under construction.

4.4 DRAINAGE Retention: Drainage retention facilities shall be designed in conformance with the guidelines contained in these Standards and shall be to a standard not less than the following criteria:

a. Volume (V): Drainage facilities shall have the capacity to hold the total runoff from a 50 year frequency, 24 hour storm. The volume shall be determined with no allowance for percolation or outlet facilities using the following basic formula:

$$V = \frac{CAR}{12}$$

V: Volume in acre-feet

C: Coefficient of Runoff (see section 4.3 part b)

A: Area in acres (see section 4.3 part d)

R: 1.80 times M.A.P. divided by 10.9 (for M.A.P. see Plate 4-B)

$$R = 1.8 \times \frac{M.A.P.}{10.9}$$

b. Elevation: Drainage retention facilities shall be designed so that a hydraulic grade line (HGL) extended from the drainage retention facility's highest water surface elevation (Z) shall be at least 6 inches below all tributary drainage inlets at their respective locations. The HGL at a given point shall be calculated using the following formula:

$$HGL = Z + Hf$$

HGL: Hydraulic grade line elevation in feet at a particular point

Z: The high water surface elevation of a drainage facility in feet

Hf: Head loss in feet due to friction loss from a pipe. The friction loss shall be calculated using the following formula:

$$Hf = \frac{(3.022)(v)^{1.85}(L)}{(C)^{1.85}(D)^{1.165}}$$

v: Velocity of water in pipe in feet per second (assume full pipe)

L: length of pipe in feet

D: Inside diameter of pipe in feet

C: Design coefficient based on pipe material. Coefficient to be extrapolated from the following table:

Pipe	C
Steel welded and seamless	100
Steel corrugated	60
Concrete	100
Cement-asbestos	140
Cast iron	100
Cast iron tar (asphalt) coated	100
Cast iron cement lined	140
Cast iron bituminous lined	140
Cast iron galvanized	100
Plastic	130

c. Dewatering: A drainage facility must be emptied of a 10 year event storm within 48 hours by outlet facilities providing positive drainage or through percolation.

4.5 **DISCHARGE APPROVAL AND PERMITS:** It shall be the responsibility of the Developer to obtain written approval and encroachment permits from all agencies controlling the discharge of drainage into the receiving waterways.

4.6 **ROCK WELLS:** Rock wells (vertical and horizontal), when approved by the Engineer, shall be constructed as shown on the plates contained in these Standards. The rock wells shall be located at least 150 feet from domestic water wells. Individual rock wells shall have a 20 foot minimum horizontal separation from all other vertical rock wells. Rock wells shall store the volume from a 50 year frequency storm and be designed in the following manner:

a. Find Percolation Rate (PR): For design purposes this value shall be determined by the design engineer by means of a percolation test performed by a qualified testing firm. The test shall be taken at the intended location, both horizontal and vertical of said drainage unit. The percolation rate shall be expressed in cubic feet per minute. The percolation rate shall be sufficient to completely percolate a 10 year storm's stored volume within 48 hours

b. Determine the Volume of Storm Water (V): See methodology in item 4(a) above. The volume shall be determined with no allowance for percolation or outlet facilities.

c. Determine the Storage Volume (SV): Storage may be a combination of surface, subsurface or aggregate voids. If a portion of the paved roadway is intended to be used for storage, the stored water on the pavement shall not encroach into the travel way of the nearest traffic lane.

d. Dewatering: A rock well must be emptied of a 10 year event storm within 48 hours through percolation.

f. Testing: Rock wells shall be tested for adequacy after their completion. Testing shall consist of flooding the rock well at a rate equal to its design percolation for a duration equal to the Peak Flow Time. If a static head is obtained then the rock well shall be allowed to drained for 1 hour, then refilled and its percolation rate calculated.

The measured percolation rate of the drainage unit shall be compared to the design percolation rate. If the measured rate is less than the design, additional percolation area will be required.

4.7 PIPE: Storm drain pipe shall be as shown on the plates contained in these Standards, and conform to the following:

a. Material: The pipe material may be reinforced concrete, non-reinforced concrete, cast-in place concrete or high density polyethylene (HDPE). The type of pipe used and its intended use must conform to accepted engineering practice and must be approved by the Engineer.

The class of pipe to be used shall be clearly shown on the improvement plans and specified in the special provisions, if any. All pipe shall conform to State Standards.

b. Size: Catch basin laterals, mains, trunk lines, cross culverts or any other type of gravity flow storm drainage pipe shall be smooth walled and no less than 18 inches in diameter.

Pipe curvature between man holes shall not exceed manufactures recommendations.

Pipe sizes shall not decrease going down stream.

Minimum Cover: Pipe alignment shall be designed to allow for a minimum cover of 30 inches as measured from the natural ground or finished grade of pavement to the inside top of pipe.

c. Velocity: Pipes (for calculation purposes) shall be considered to be flowing full. Minimum velocity shall be a velocity sufficient to maintain a clean pipe generally not less than 2 feet per second.

d. Installation: The pipe shall be laid in conformity with the prescribed lines and grades.

The design engineer shall field verify the depth and alignment of existing storm drain lines prior to construction. If the existing storm drain line depth, alignment and size is not as shown on the improvement plans, the design

engineer shall notify the Engineer and make appropriate corrections before proceeding.

All adjustment of pipe to line grade shall be made by scraping away or filling in and tamping under the body of the pipe and not by blocking or wedging. All pipe sections shall be laid with bell end upstream and shall be laid upstream (from the lowest point to the highest point) and from structure to structure. Grade stakes shall be provided at 25 foot intervals, and each stake shall be used in establishing the grade for the pipe.

4.8 MANHOLES: Storm drain manholes shall be constructed as shown on the plates contained in these Standards.

Manholes shall not be constructed within a gutter.

Manholes shall be placed at junction points, changes in gradient, and changes in pipe size. On curved pipes with radii of 200 feet to 400 feet, manholes shall be placed at the beginning of the curve (BC) and at the ending of the curve (EC) and on 300 foot maximum intervals along the curve. On curves with a radii exceeding 400 feet, manholes shall be placed at the BC and EC of the curve and on 400 foot maximum intervals along the curve for pipes 24 inches and less in diameter and 500 foot intervals along the curve for pipes greater than 24 inches in diameter. Manhole locations on curves with radii less than 200 feet will be specified on an individual basis.

Spacing of manholes shall not exceed 500 feet. Whenever possible spacing of manholes shall be equal.

Manhole covers shall be as shown in the plates of these Standards.

4.9 CATCH BASIN: Catch basins shall be as shown in the plates of these Standards. Catch basins shall not be allowed to drain into or through other catch basins without the approval of the Engineer.

The maximum lineal feet of road right-of-way that may discharge into a catch basin is 500 feet. However, in no case shall the width of water flowing in the gutter be allowed to encroach into the traveled way of the nearest traffic lane.

Metal parts of all catch basin grates and frames shall be hot dipped galvanized.

4.10 DRAINAGE PUMPS: Drainage pumps shall only be used for emptying drainage retention facilities. Inflow pumps shall not be allowed. If pumps are used to empty a drainage facility, the following criteria shall be incorporated into the design of the pump station:

a. Pump station shall be designed with a securable facility.

b. Drainage pumps shall be submersible and be of the non-clog type capable of passing at least 3 inch spheres. Each installation shall have two pumps

that automatically operate on an alternating basis with both pumps operating together during times of heavy flow. The design pumping head shall be based on the maximum flood water elevation in the receiving facility.

c. Performance curves shall be submitted for the pumps showing the diameter of the runner to be used, the pump capacity, total dynamic head, kilowatts, horse power, and efficiency of pump throughout the working range of the pumps.

d. The pump station and wet well shall be lighted. Lights shall be switchable.

e. The wet well rim and electrical panel shall be above the 100-year flood elevation.

f. A securable NEMA weatherproof enclosure shall be provided for all outdoor controls, including lighting. Electric service shall be provided by underground conduit to the utility service pedestal.

g. Controls shall be a solid state programmable controller with LED digital readout with purge and clean capacities and automatic pump alternating. Switches for manual operation of each pump shall be included.

h. An on-site alarm with an automatic telephone dialer with message capability, exterior lights and horn shall be installed. The alarm shall have a battery back-up, and sensors that will respond to power failure, pump failure and high water level.

i. An access and work area for the pump station shall be provided. The access and work area shall be paved with a minimum of 2 inches of AC over 4 inches of AB or 5.5 inches of concrete as shown on the plans approved by the Engineer.

j. Trash racks shall be provided upstream from the pumps. The trash rack shall be designed to be easily cleaned.

k. Emergency operation during power outages shall be provided by a connection for a County portable generator.

l. All electrical installations shall comply with the National Electric Code, NEMA, Division of Industrial Safety, and County of Stanislaus Electrical Code. All local utility requirements shall be met. A building permit for the electrical service will be required from the County.

m. The County shall be provided with 3 complete sets of manufacturer's brochures, technical data, operation and maintenance manuals, schematics, wiring diagrams, warranties, etc. for all equipment and controls. Said data shall be provided to the Engineer organized with each set in its own three

ring binder. The Developer shall provide on-site training for County maintenance personnel.

4.11 **EXCAVATION AND BACKFILL:** Excavation and backfill shall be as per the plates in these Standards. If a situation arises that is not covered, then the excavation and backfill shall be per State Standards.

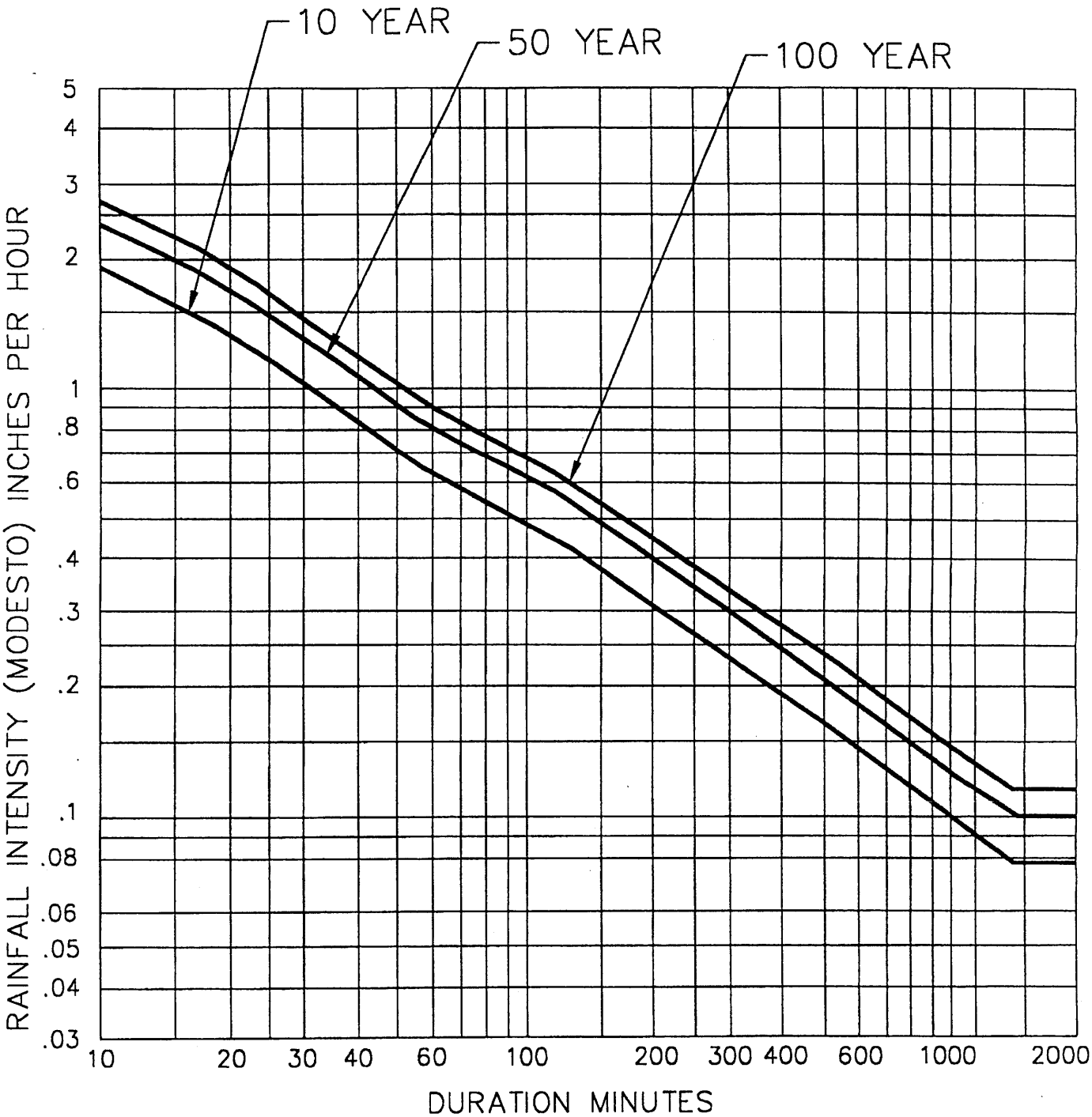
4.12 **TESTING:** Testing for proper compaction and for control of the concrete shall be as directed and observed by the Engineer. Testing shall be performed by the Developer unless otherwise directed by the Engineer. Certificates of Compliance, weigh master tags or other standard design data may be required by the Engineer in lieu of testing for proper concrete design. The cost of all testing shall be at the Developer or Contractor's expense.

4.13 **INSPECTION:** All work shall be inspected by the Engineer prior to backfilling. After compaction has been completed all new lines shall be inspected with closed circuit television or by visual inspection. The method of inspection will be at the discretion of the Engineer.

If closed circuit television is used, the Developer shall give the Engineer at least 2 working days notice prior to televising the work. All dirt and other debris shall be cleaned from the pipeline and manholes, trenches shall be compacted and manhole rims raised to grade. Infiltration, leaks and deficiencies shall be corrected prior to inspection. The suitability of the system for televising shall be at the discretion of the Engineer. The Engineer shall be present during the televising of the work.

The tape (in VHS format) and tape logs shall be provided to the Engineer after the system has been televised.

The Developer shall repair all substandard work to the Engineer's satisfaction.



THESE CURVES ARE BASED ON CALIFORNIA DEPARTMENT OF WATER RESOURCES DATA FROM THE MODESTO RAINFALL GAGING STATION. (MEAN ANNUAL PRECIPITATION = 10.9 INCHES).
TO OBTAIN INTENSITITES FOR LOCATIONS OTHER THAN MODESTO, MULTIPLY INTENSITY ON THIS CHART BY MEAN ANNUAL PRECIPITATION AT THE POINT IN QUESTION DIVIDED BY 10.90.

APPROVED _____ DATE JUN 9 1998

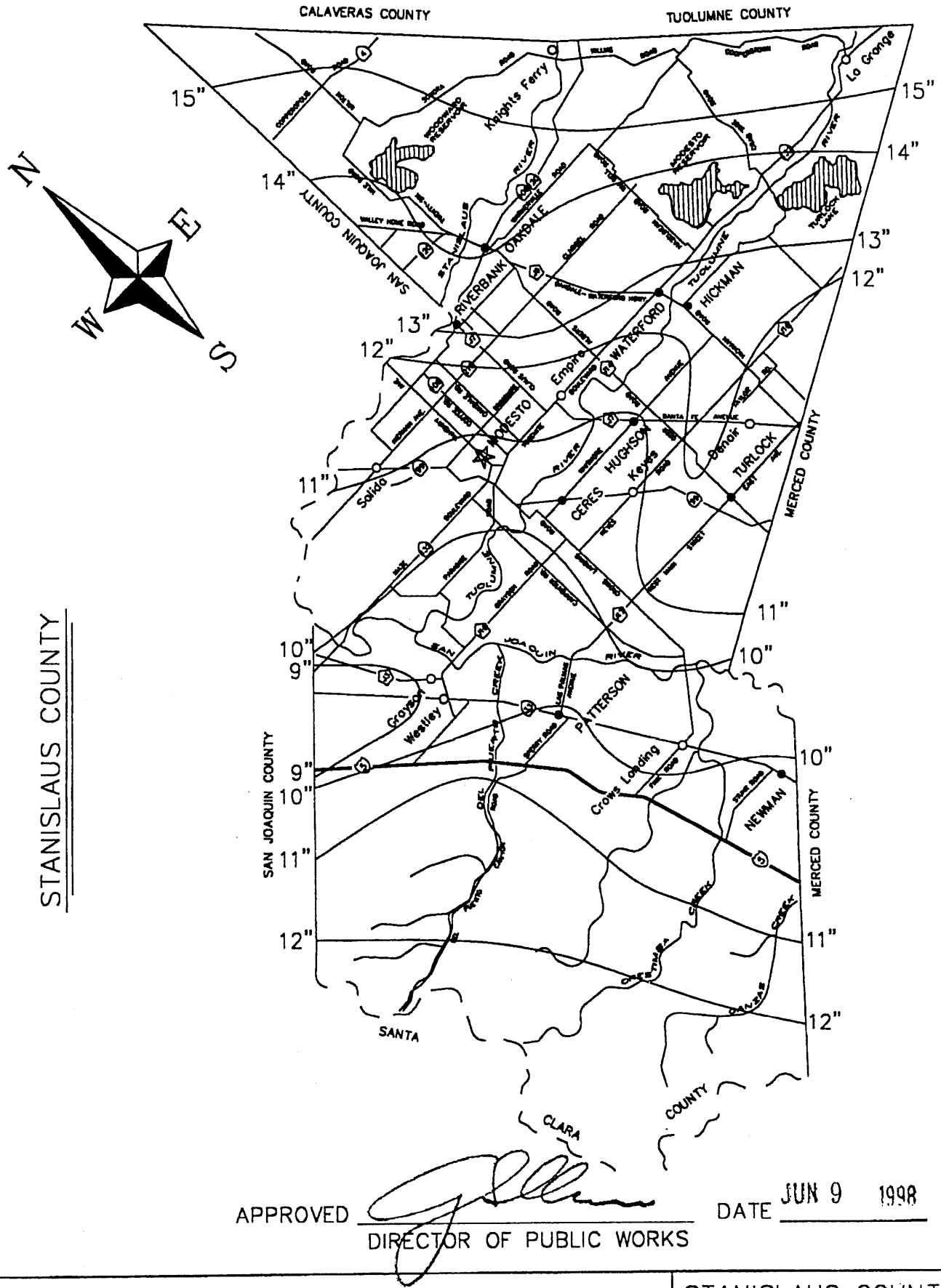
DIRECTOR OF PUBLIC WORKS

IMPROVEMENT STANDARDS

STANISLAUS COUNTY

RAINFALL INTENSITY CURVES

PLATE 4-A



APPROVED _____ DATE JUN 9 1998

DIRECTOR OF PUBLIC WORKS

IMPROVEMENT STANDARDS

STANISLAUS COUNTY

MEAN ANNUAL PRECIPITATION

PLATE 4-B

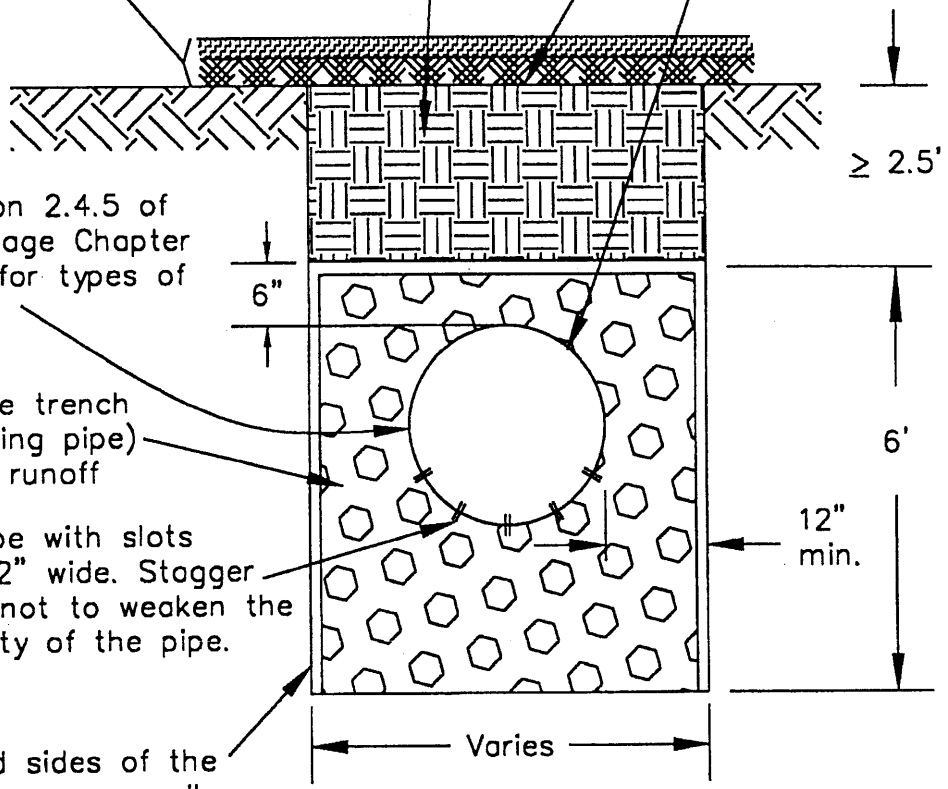
Plate	4-C1	Removed
Plate	4-C2	Removed
Plate	4-C3	Removed
Plate	4-C4	Removed
Plate	4-C5	Removed

Use a pavement and base thickness of 0.1' thicker than the existing. The minimum thickness for the pavement and base shall be 0.25' and 0.50' respectively.

95% Compaction of Backfill Soil and Base Rock

Roadway/Sidewalk subgrade or ground surface.

Use 3/4" to 2-1/2" clean crushed rock in trench.

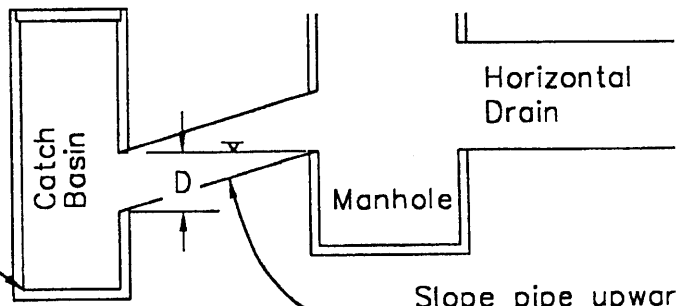


Reference Section 2.4.5 of the Storm Drainage Chapter of this manual for types of pipe allowed.

Use 25% of the trench volume (excluding pipe) for storage of runoff

Perforate the pipe with slots 12" long and 1/2" wide. Stagger the slots so as not to weaken the structural integrity of the pipe.

Line the top and sides of the trench with non-woven needle-punched engineering fabric that weighs 6 oz. per square yard or greater.



Drop the bottom of the inlet and manhole at least 2' below pipe invert.

Slope pipe upwards to the manhole one pipe diameter.

Approved _____ Date: JUN 9 1998

DIRECTOR OF PUBLIC WORKS

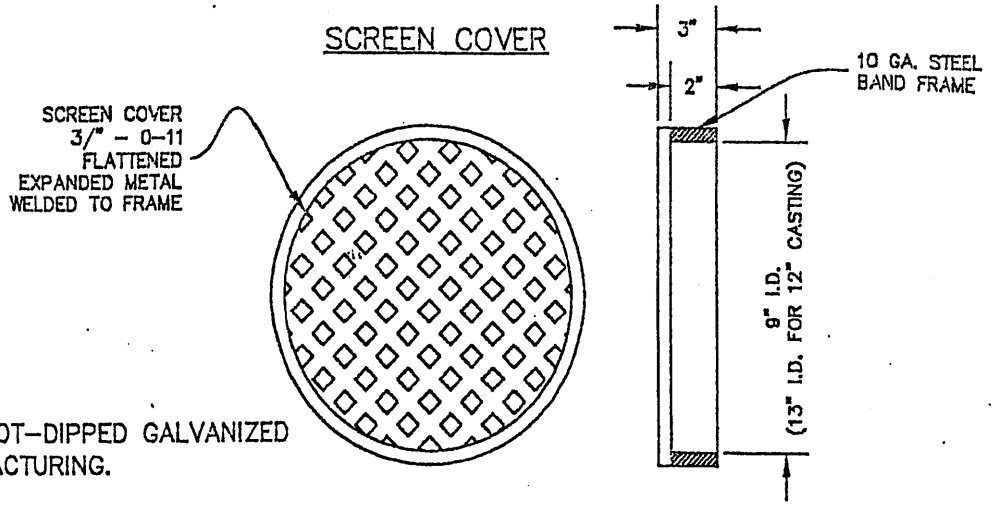
IMPROVEMENT STANDARDS

STANISLAUS COUNTY

TYPICAL HORIZONTAL DRAIN

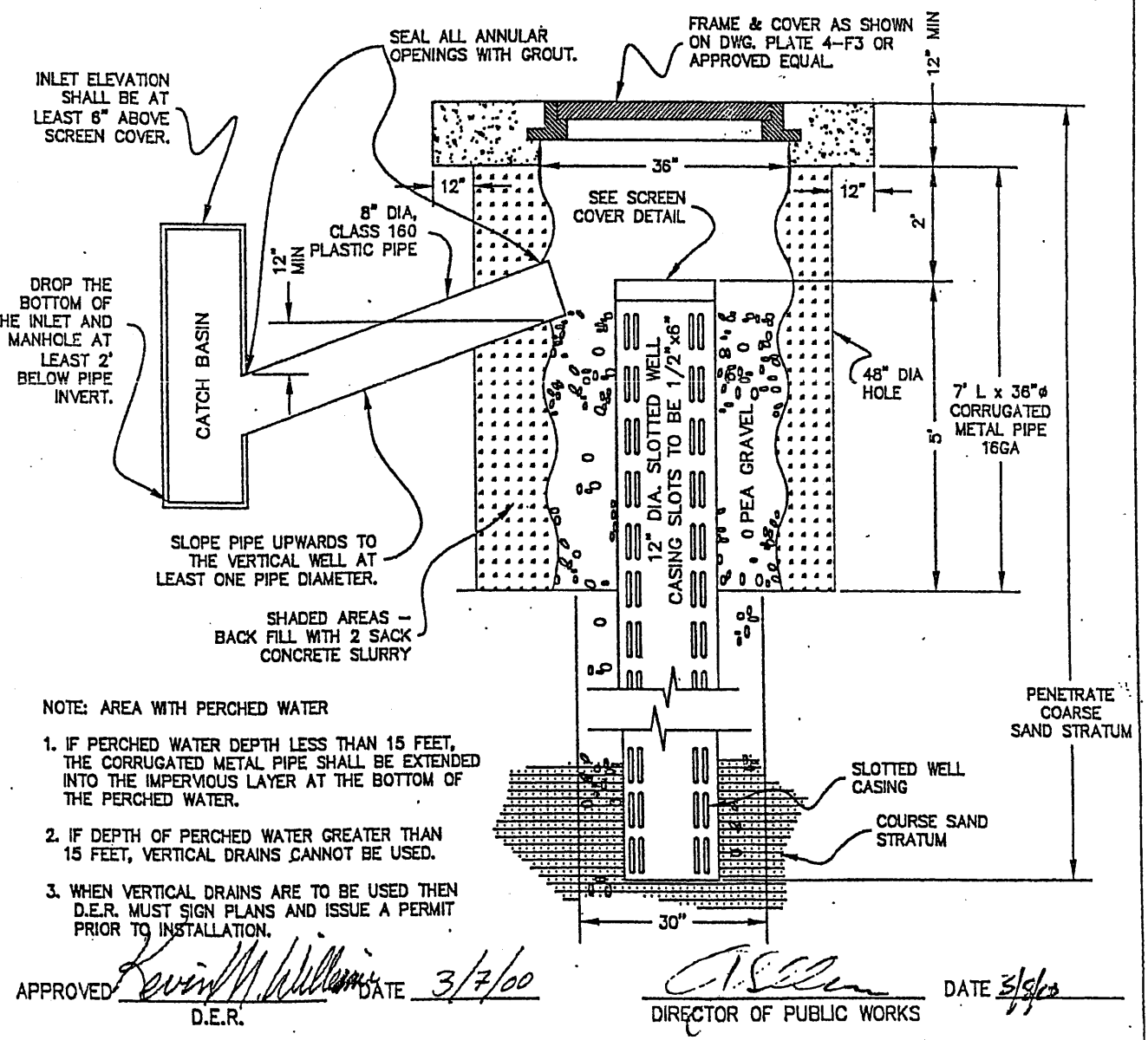
PLATE 4-D1

SCREEN COVER



NOTE

1. UNIT TO BE HOT–DIPPED GALVANIZED AFTER MANUFACTURING.



NOTE: AREA WITH PERCHED WATER

1. IF PERCHED WATER DEPTH LESS THAN 15 FEET, THE CORRUGATED METAL PIPE SHALL BE EXTENDED INTO THE IMPERVIOUS LAYER AT THE BOTTOM OF THE PERCHED WATER.
2. IF DEPTH OF PERCHED WATER GREATER THAN 15 FEET, VERTICAL DRAINS CANNOT BE USED.
3. WHEN VERTICAL DRAINS ARE TO BE USED THEN D.E.R. MUST SIGN PLANS AND ISSUE A PERMIT PRIOR TO INSTALLATION.

APPROVED Kevin M. Williams DATE 3/7/00
D.E.R.

DIRECTOR OF PUBLIC WORKS DATE 3/8/00

IMPROVEMENT STANDARDS

REVISED (03–01–2000)

STANISLAUS COUNTY

VERTICAL DRAIN

PLATE 4–D2

NOTE:
FOR TRENCHING AND PIPE INSTALLATION SEE PLATES 3-H1 AND 3-H2.

APPROVED _____ DATE JUN 9 1998

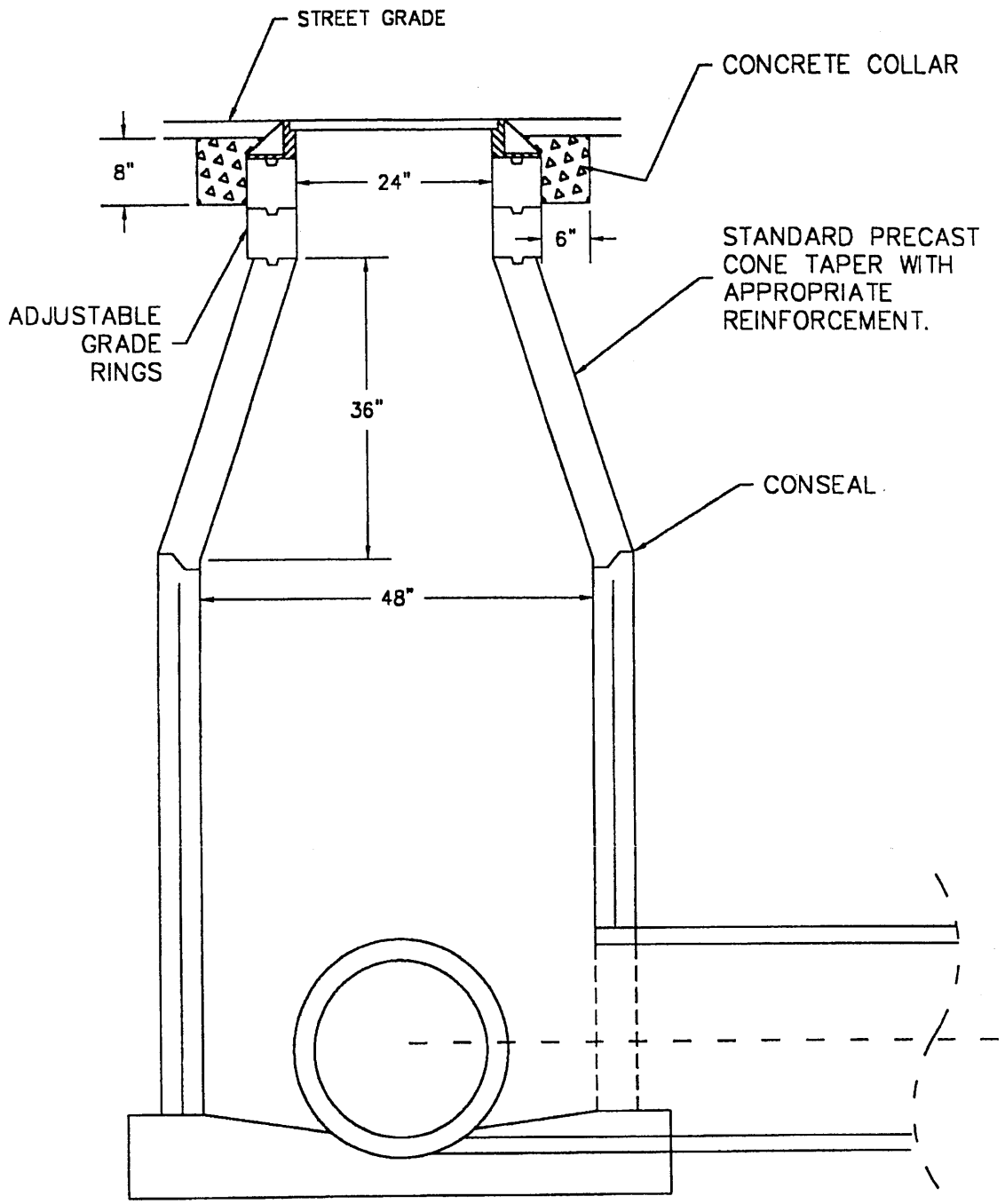
DIRECTOR OF PUBLIC WORKS

IMPROVEMENT STANDARDS

STANISLAUS COUNTY

CATCH BASIN TO MANHOLE CONNECTION

PLATE 4-E



NOTES:
1. FOR MANHOLE BASE SEE PLATE 4-F2
2. FOR MANHOLE FRAME AND COVER SEE PLATE 4-F3

APPROVED _____ DATE JUN 9 1998

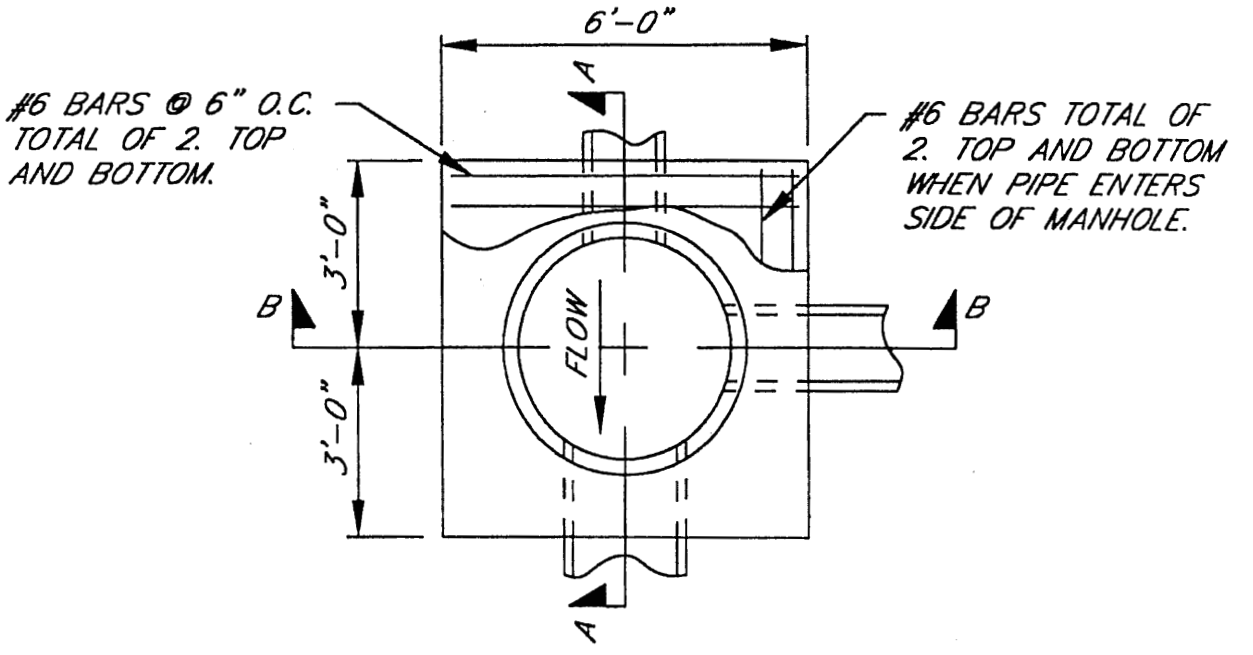
DIRECTOR OF PUBLIC WORKS

IMPROVEMENT STANDARDS

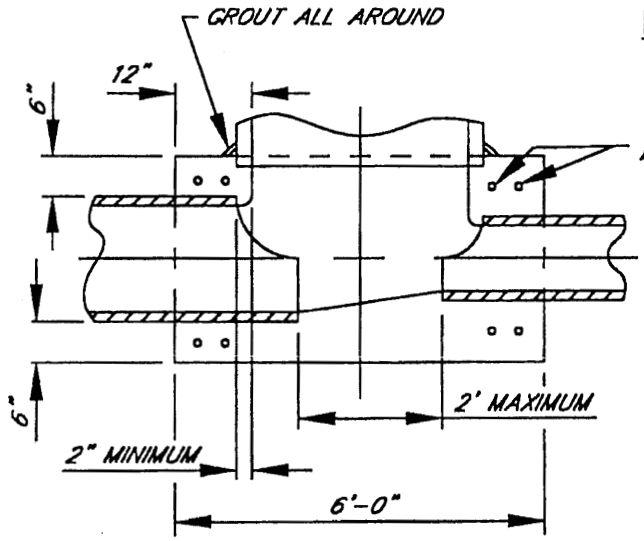
STANISLAUS COUNTY

TYPICAL MANHOLE

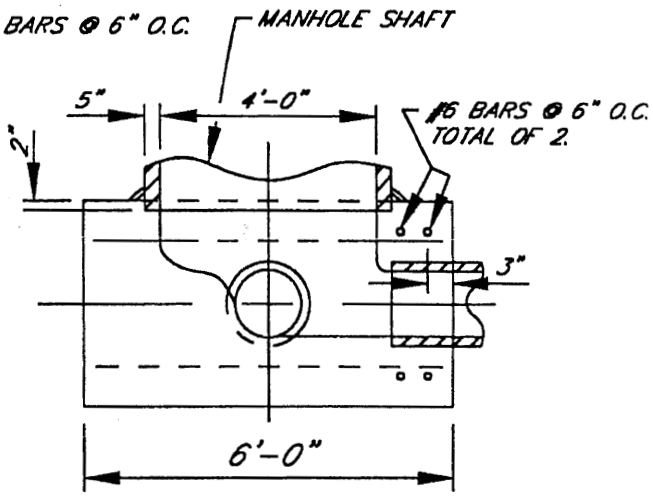
PLATE 4-F1



PLAN



SECTION A–A



SECTION B–B

NOTES

1. ALL CONCRETE TO BE CLASS "A".
2. MATCH SPRING LINES OF PIPES ENTERING M.H. UNLESS OTHERWISE NOTED.
3. CUT PIPES TO ALLOW SETTING OF 4' DIAMETER CYLINDRICAL FORM FROM 6" ABOVE MAIN LINE PIPE TO SPRING LINE. CUT PIPE 2" LARGER THAN FORM TO ALLOW 2" CONCRETE OVER ENDS OF ALL CUT PIPE.
4. INVERT AND BASE OF M.H. TO BE POURED AND INVERT TO BE SHAPED BY HAND TO MAKE SMOOTH TRANSITION. FINISH WITH RUBBER FLOAT.
5. CENTER M.H. ON PIPE JOINT WHERE PIPE CHANGES SIZES, LEAVING A GAP OF 12" MINIMUM, 24" MAXIMUM.

APPROVED _____ DATE JAN 9 1998

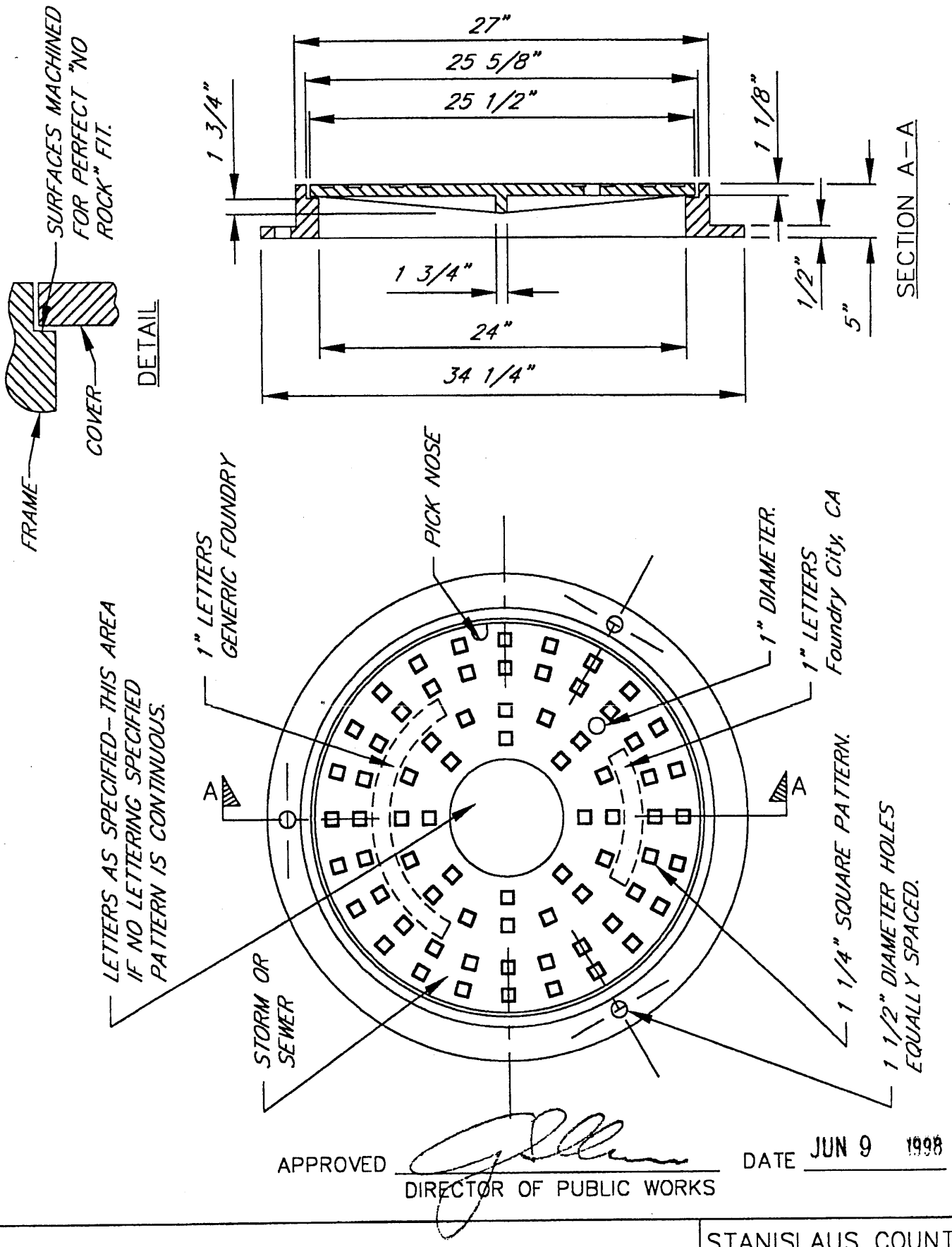
DIRECTOR OF PUBLIC WORKS

IMPROVEMENT STANDARDS

STANISLAUS COUNTY

STORM DRAIN MANHOLE BASE – 48"

PLATE 4–F2

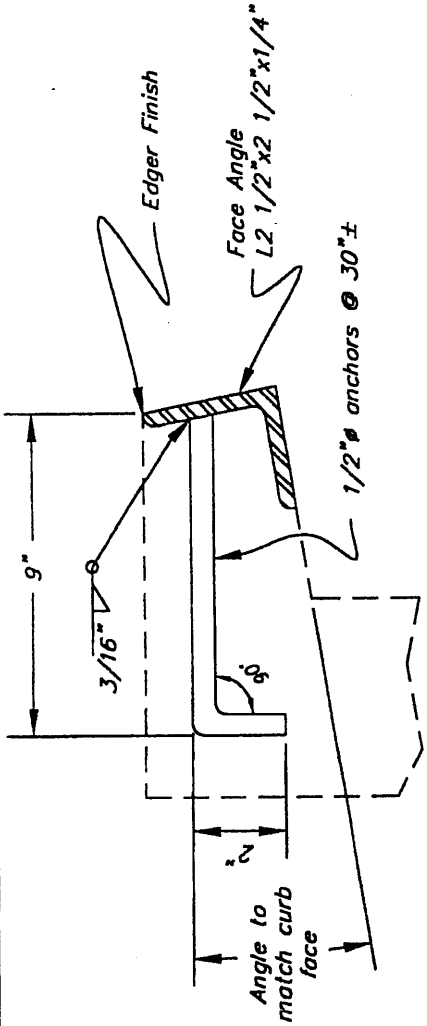


IMPROVEMENT STANDARDS

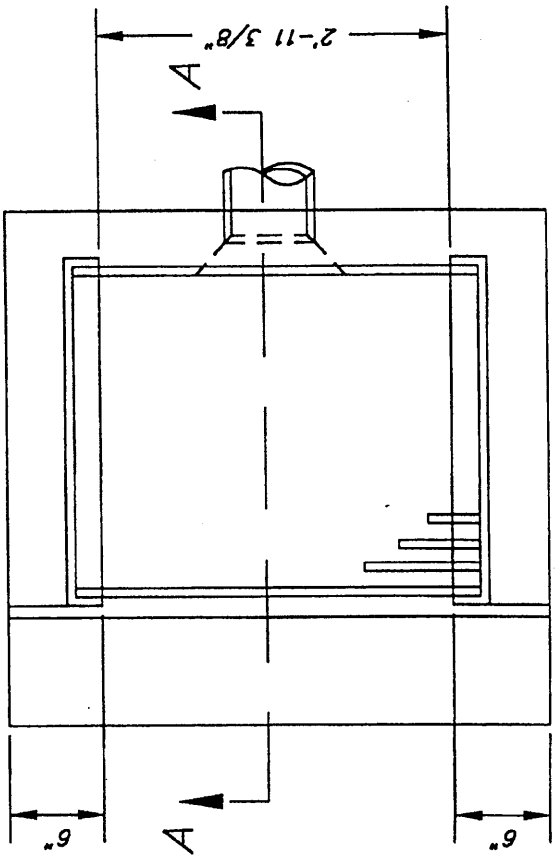
STANISLAUS COUNTY

MANHOLE FRAME AND COVER

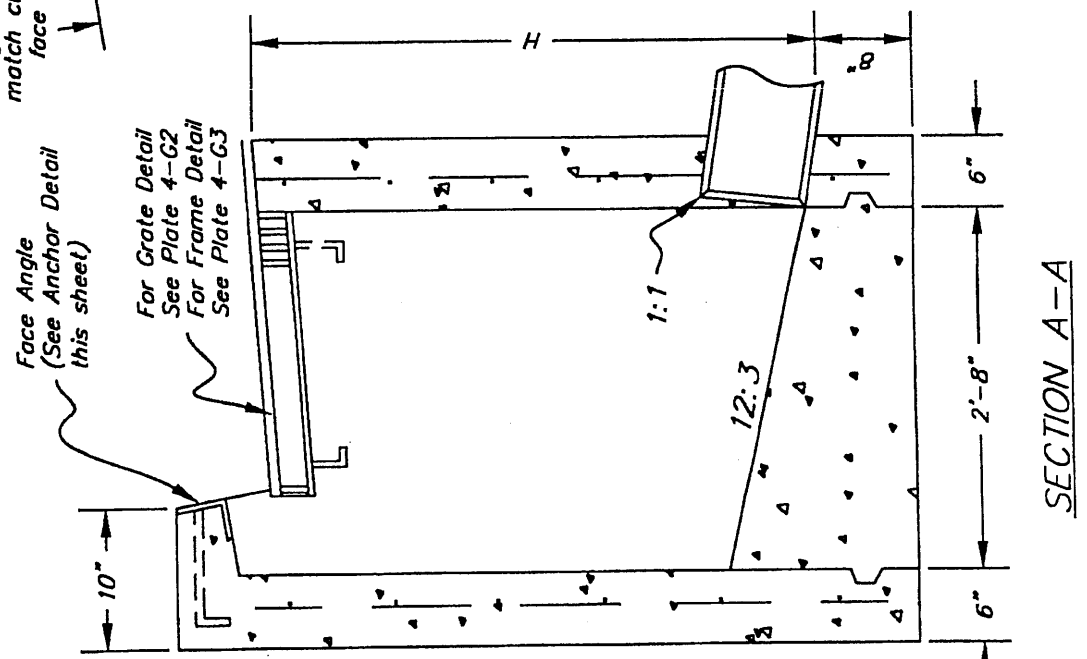
PLATE 4-F3



FACE ANGLE ANCHOR DETAIL



PLAN



SECTION A-A

APPROVED _____ DATE JUN 9 1998

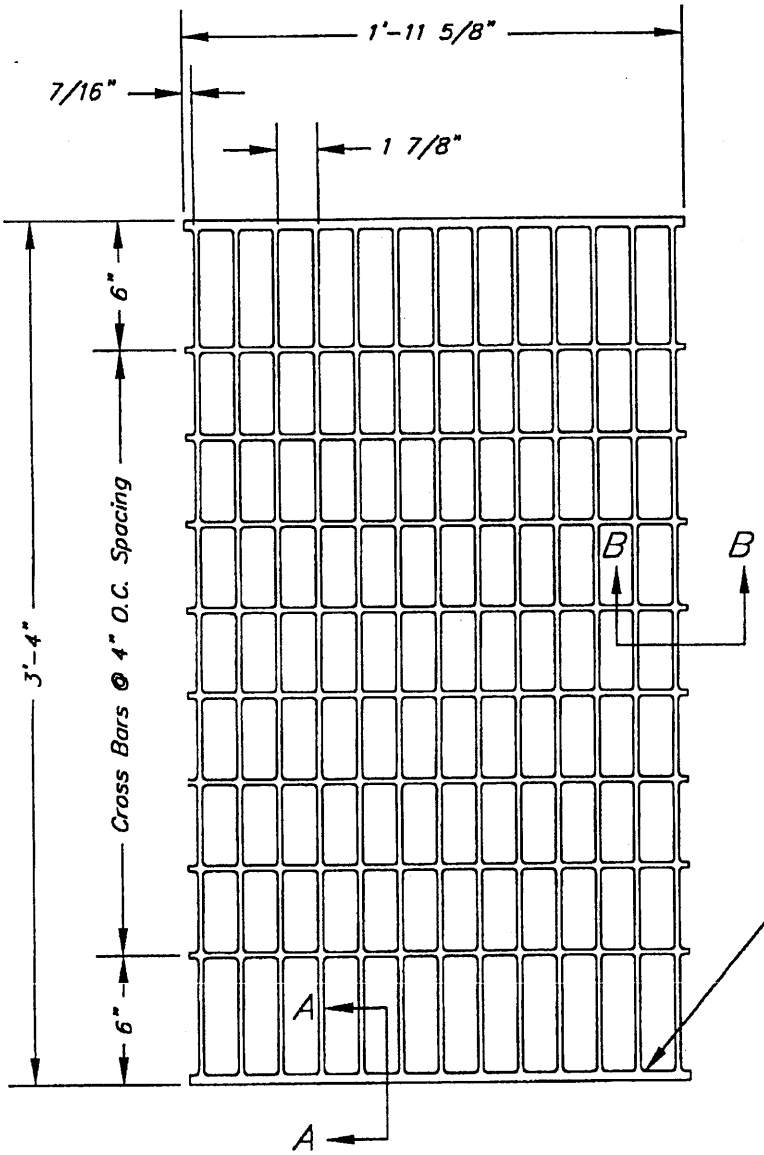
DIRECTOR OF PUBLIC WORKS

IMPROVEMENT STANDARDS

STANISLAUS COUNTY

G. O. CATCH BASIN

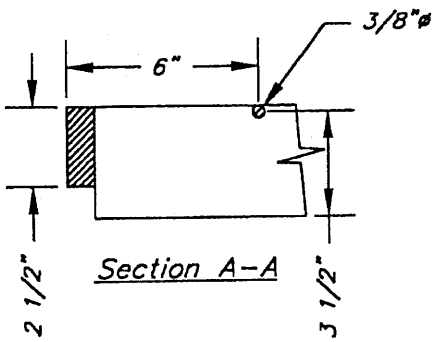
PLATE 4-G1



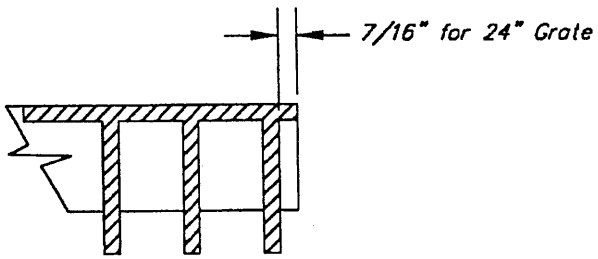
Notes:

1. Bearing Bars to be 3 1/2" x 1/4" bars on 1 7/8" Centers.
2. 3/8" ø Cross Bars may be fillet welded, resistance welded or electroforged to Bearing Bars.
3. Weight of 24" Grate = 141lbs.
4. Grate shall be chained to catch basin.

3/16 Fillet Weld full depth each side on Outside Bearing Bars and on every third internal Bearing Bar.



Section A–A



Section B–B

APPROVED _____ DATE JUN 9 1999

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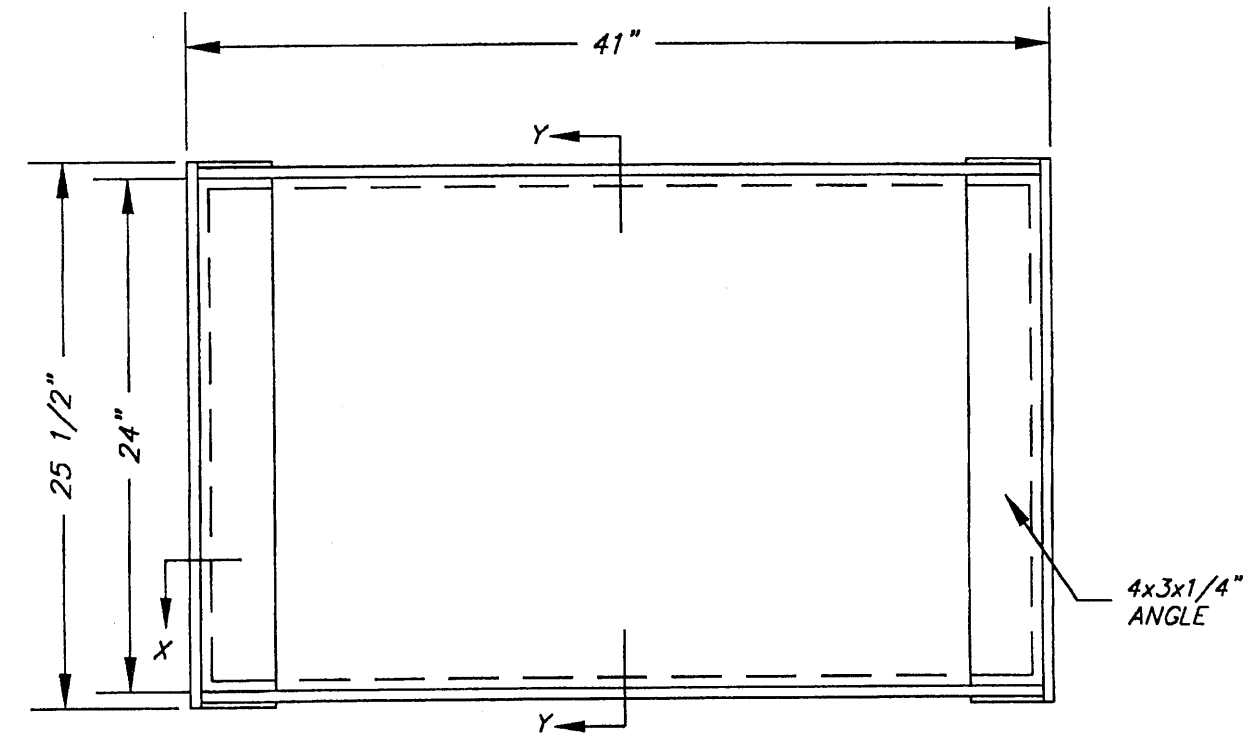
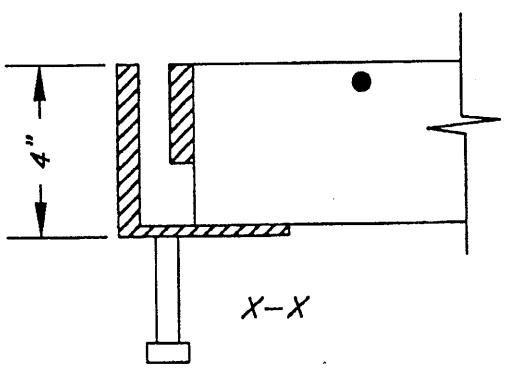
IMPROVEMENT STANDARDS

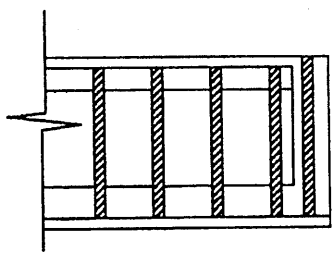
STANISLAUS COUNTY

G. O. CATCH BASIN GRATE

PLATE 4–G2







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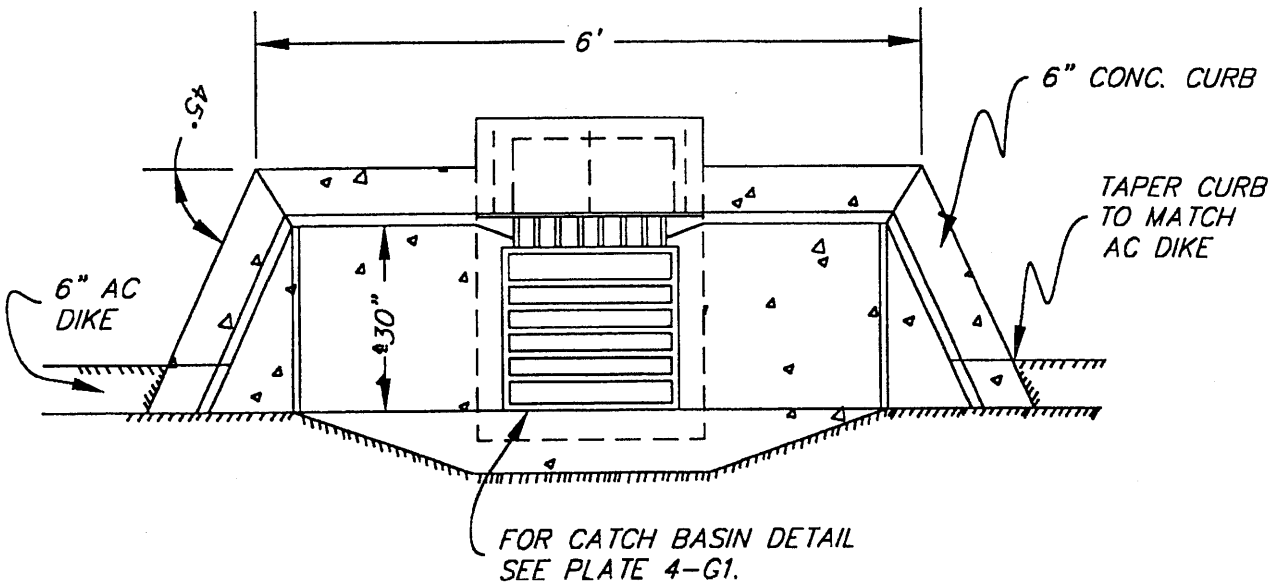
IMPROVEMENT STANDARDS

STANISLAUS COUNTY

G. O. CATCH BASIN FRAME

PLATE 4-G3



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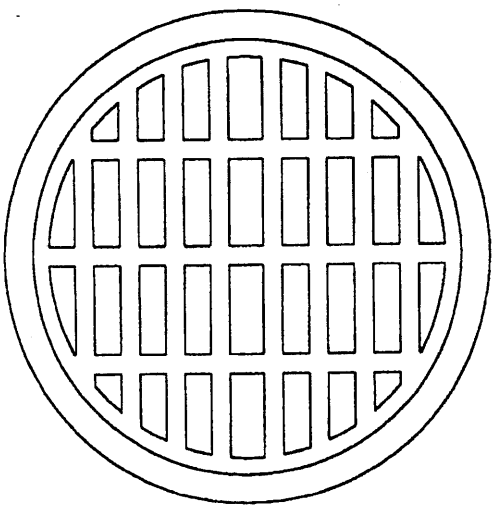
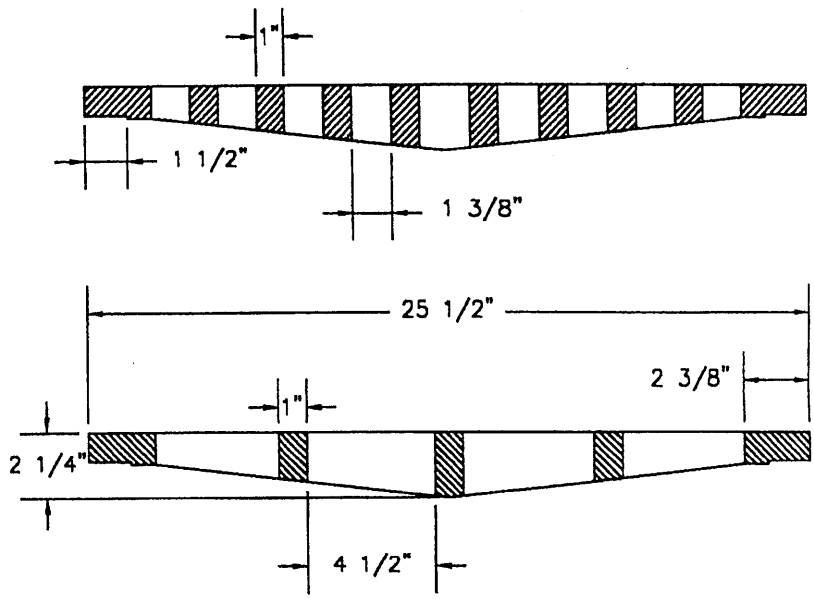
IMPROVEMENT STANDARDS

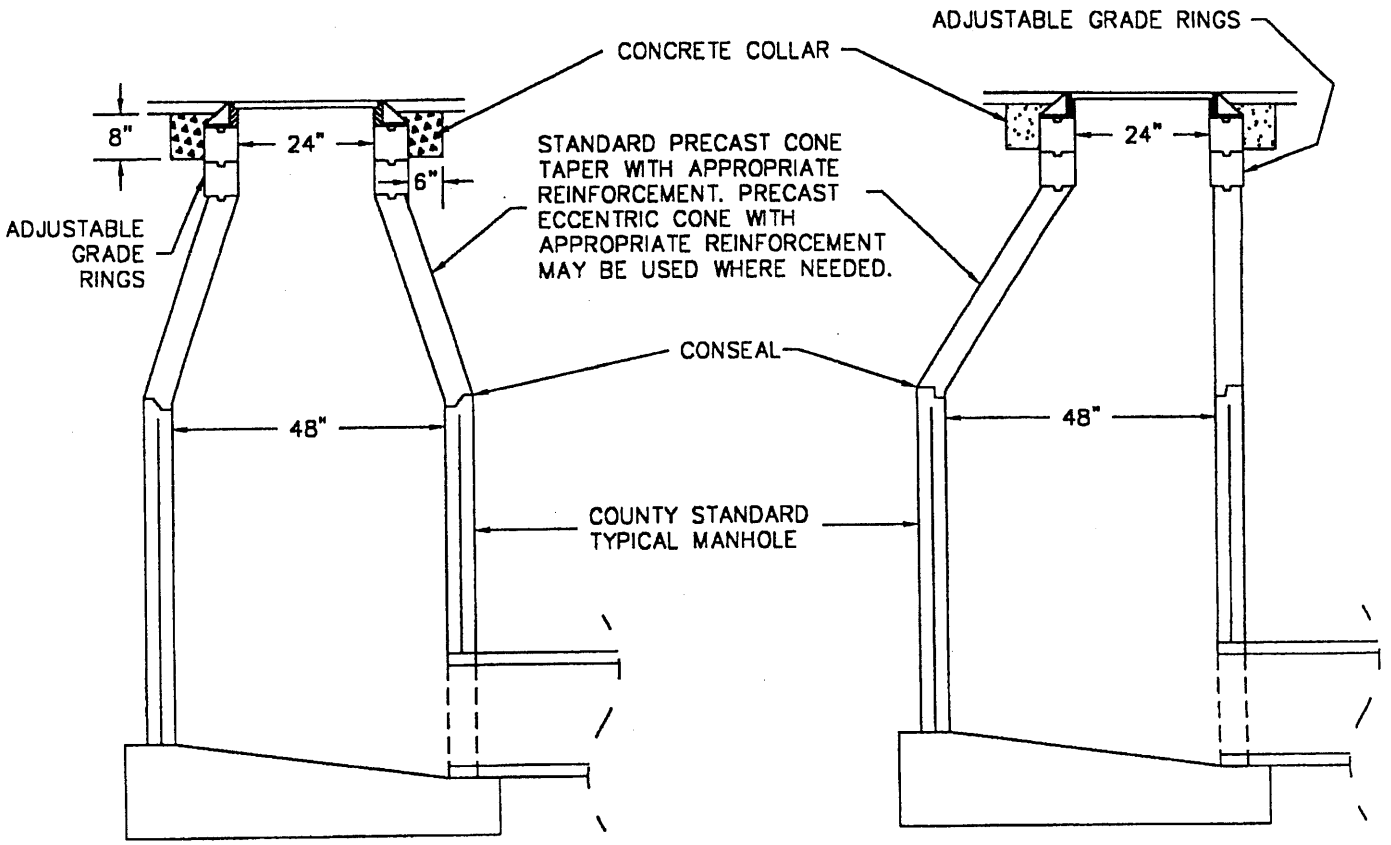
STANISLAUS COUNTY

G. O. CATCH BASIN IN A.C. DIKE

PLATE 4-G4







NOTE: THIS CATCH BASIN IS TO BE USED IN AREAS WITHOUT CURBING OR A.C. DIKE.

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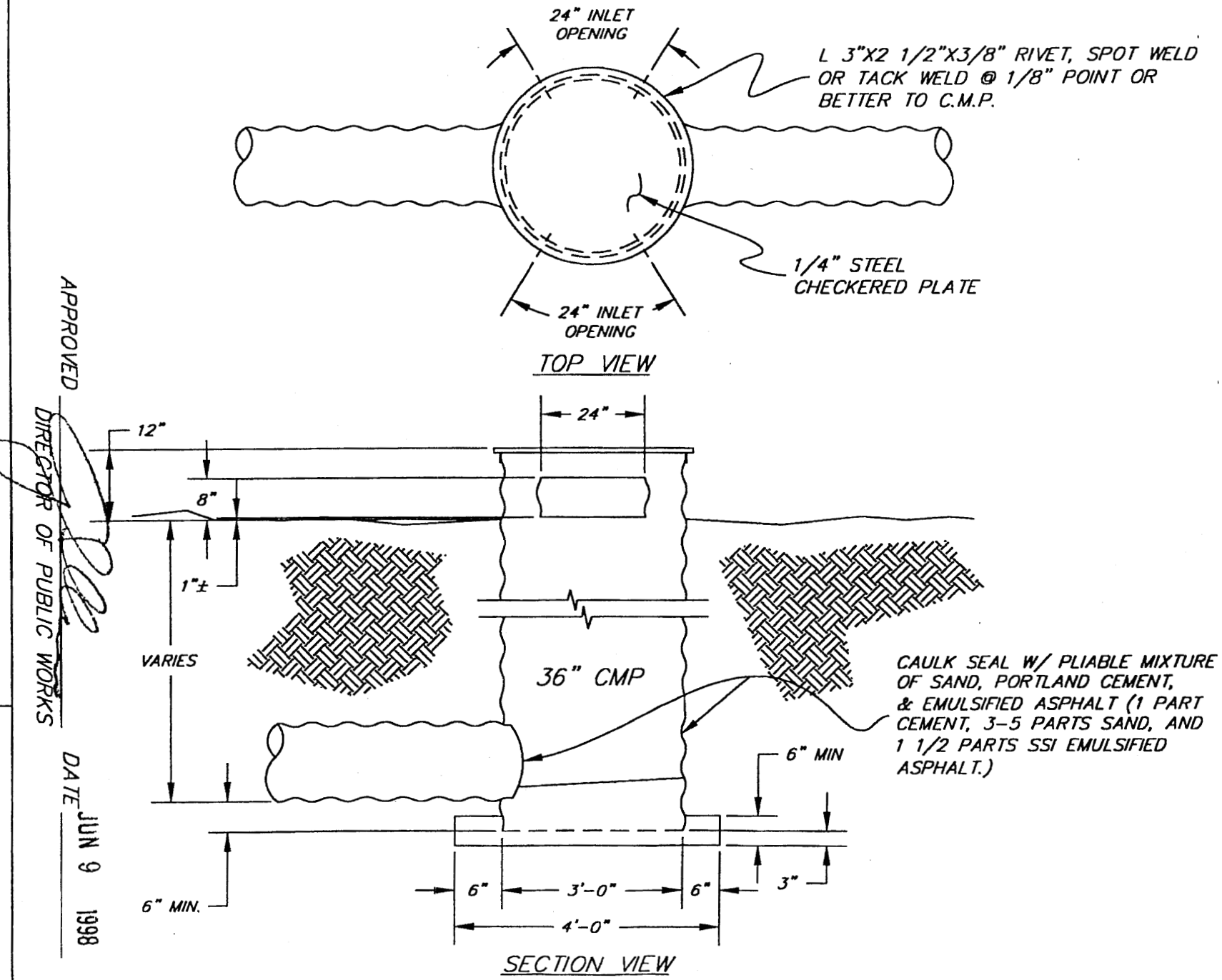
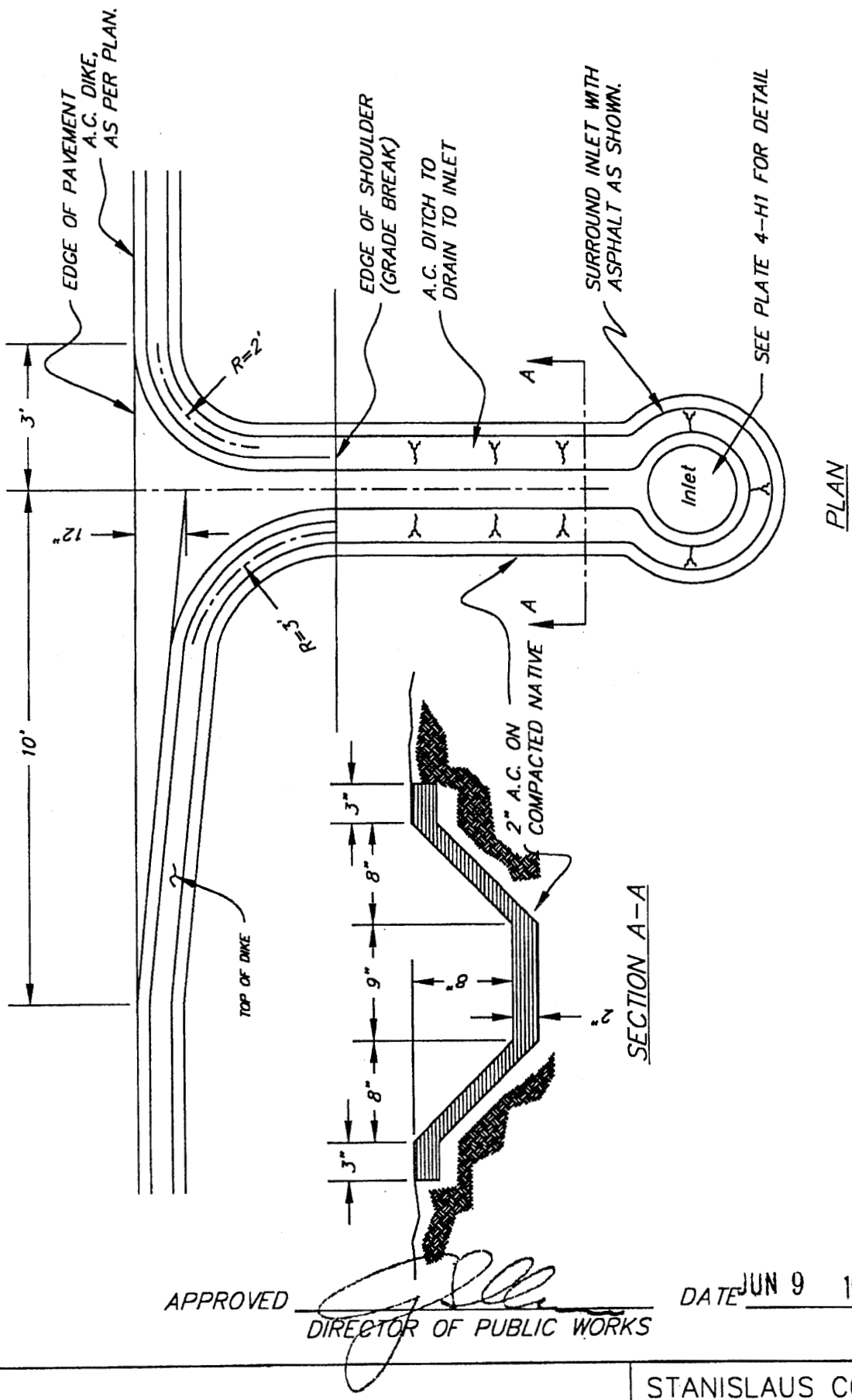
IMPROVEMENT STANDARDS

STANISLAUS COUNTY

CATCH BASIN ALTERNATE

PLATE 4-G5


24" INLET OPENING
L 3"X2 1/2"X3/8" RIVET, SPOT WELD OR TACK WELD @ 1/8" POINT OR BETTER TO C.M.P.
1/4" STEEL CHECKERED PLATE
24" INLET OPENING
TOP VIEW
24"
12"
8"
1"±
VARIES
36" CMP
CAULK SEAL W/ PLIABLE MIXTURE OF SAND, PORTLAND CEMENT, & EMULSIFIED ASPHALT (1 PART CEMENT, 3-5 PARTS SAND, AND 1 1/2 PARTS SSI EMULSIFIED ASPHALT.)
6" MIN
6" MIN.
6"
3'-0"
6"
3"
4'-0"
SECTION VIEW
APPROVED
DIRECTOR OF PUBLIC WORKS
DATE JUN 9 1998
IMPROVEMENT STANDARDS
STANISLAUS COUNTY
OVERSIDE DRAIN
SHEET 1 OF 2
PLATE 4-H1



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IMPROVEMENT STANDARDS

STANISLAUS COUNTY

OVERSIDE DRAIN
SHEET 2 OF 2

PLATE 4-H2

IMPROVEMENT STANDARDS

STANISLAUS COUNTY

DRAINAGE PIT INSTALLATION

PLATE 4-1

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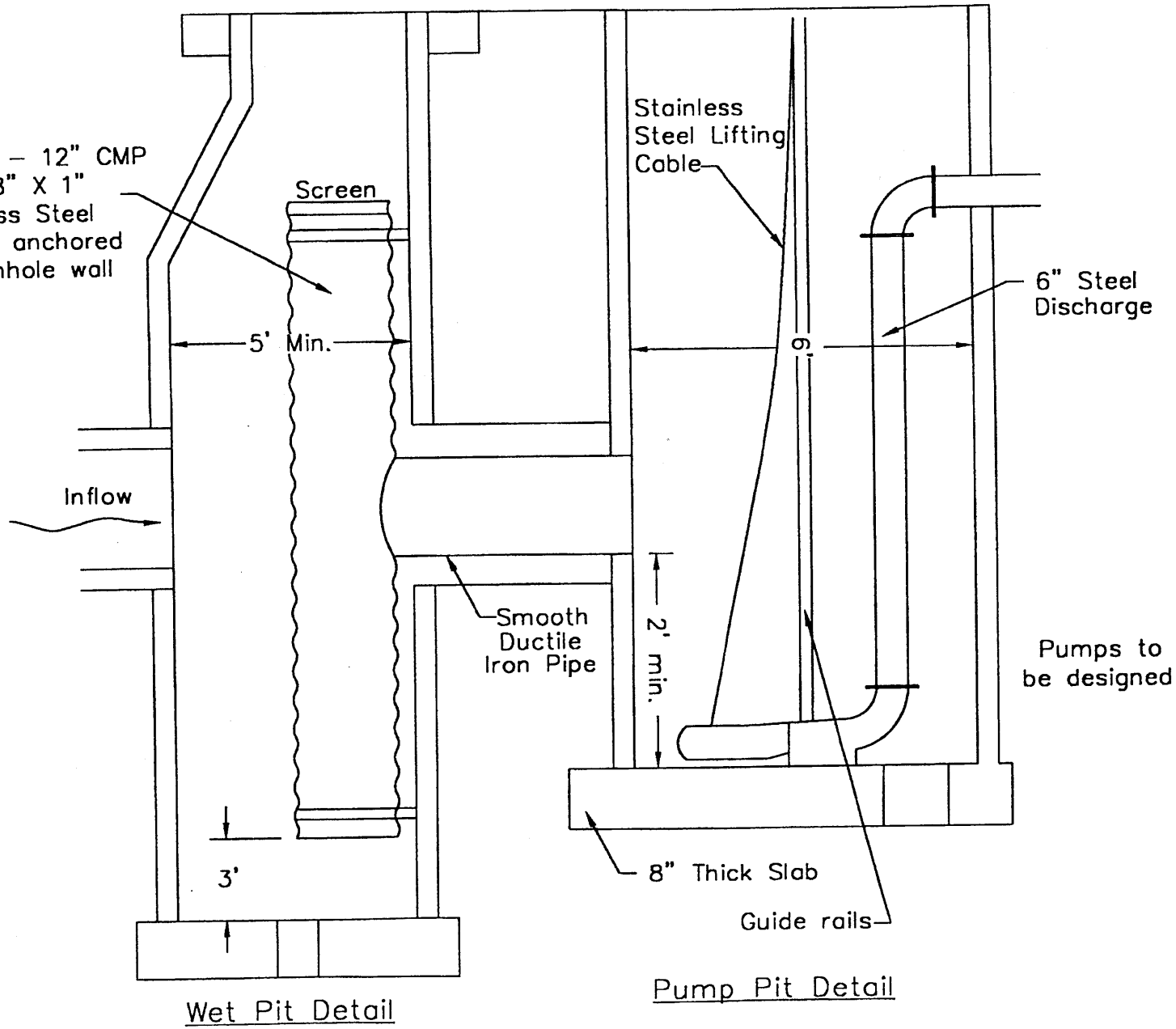
DATE JUN 3 1996



Wet Pit Detail

Pump Pit Detail